

U.S.S.N. 10/057,025

REMARKS

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 11-20 are pending in the application. Claims 11-20 stand rejected.

Objection To Action Being Made Final

The Applicants respectfully object to the Examiner's action of making the June 12, 2003 Office Action final. In the previous Office Action dated Dec. 02, 2002, no prior art references were cited in the rejection. Moreover, in the amendment filed on or about March 3, 2003, claims 11 and 14 were amended to broaden the claims, rather than narrowing the claims. No additional limitations were added to the amended claims 11 and 14. The Applicants therefore respectfully submit that the Applicants' amendment of March 3, 2003 does not necessitate the new grounds of rejection presented in the June 12, 2003 Office Action. A withdrawal of the status of final Office Action is respectfully requested of the Examiner.

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Objection to the Claims

Claim 11 is objected to due to language informalities.

Claim 11 has been amended according to the suggestions of the Examiner. A reconsideration for allowance of claim 11 is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §103

Claims 11-20 are rejected under 35 USC §103(a) as being unpatentable over Ramaswami et al '471 in view of Abe et al '562, Figueredo et al '674, Taub et al '442 and Hawkins et al '245.

It is contended that Ramaswami et al substantially teaches the present invention except a ring-shaped heater, a funnel shaped manifold, a metal seed layer, a nickel layer, and a seed layer formed of Ni or Cr. It is further contended that Abe et al teaches a ring-shaped heater, Figueredo et al teaches a center feed type ink manifold, Taub et al teaches a funnel-shaped ink manifold, and Hawkins et al teaches Ni or Cr seed layer and a plate layer of nickel.

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The rejection of claims 11-20 under 35 USC §103(a) based on Ramaswami et al, Abe et al, Figueredo et al, Taub et al and Hawkins et al is respectfully traversed.

The Applicants respectfully submit that the basic structure, as recited in independent claim 1 of the present invention, and shown in Figure 1N, is not taught or disclosed by Ramaswami et al, neither by Abe et al, Figueredo et al, Taub et al and Hawkins et al. There are at least two main features taught, disclosed and claimed in independent claim 11 not disclosed by either one of the five references. For instance:

"a funnel-shaped manifold formed in said silicon substrate;

...

a first photoresist layer of at least 2000Å thick on top of said second insulating material layer;

an ink chamber formed in said first photoresist layer in fluid communication with said funnel-shaped manifold".

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The Applicants respectfully submit that the primary reference of Ramaswami et al, as shown in Figure 4, does not teach a funnel-shaped manifold formed in a silicon substrate. The silicon substrate layer 202 of Ramaswami et al has nothing formed in it. Instead, as shown in col. 35, the firing chamber 264 (in a funnel-shape) is formed in barrier layer 260, which is formed of high-dielectric organic compounds of polymers. (Lines 6-14 and 34-42). The Applicants further submit that the funnel-shaped manifold formed in the silicon substrate of the present invention is further not taught or disclosed by Figueredo et al. Figueredo et al discloses, at col. 3, lines 59-62, and in Figure 1A, ink channels 29 or 129 (of funnel-shape) formed in an ink barrier layer 12 that is a dry film heat and pressure laminated to the thin film substrate 11 and photo defined. The ink barrier layer 12 is therefore a photoresist material and not a silicon substrate.

The Applicants further submit that Ramaswami et al does not teach an ink chamber formed in a photoresist layer and in fluid communication with the funnel-shaped manifold. As a matter of fact, Ramaswami et al teaches only a firing chamber 264 (Figure 4) for ejecting ink through orifice 108 that is heated by resistor 86. Ramaswami et al therefore teaches only a single firing chamber, and

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not an ink chamber and a funnel-shaped manifold for feeding ink into the ink chamber as taught by the present invention. The Applicants further submit that the ink chamber plus the funnel-shaped manifold structure of the present invention is not taught or disclosed by Abe et al, Figueredo et al, Taub et al and Hawkins et al.

The rejection of claims 11-20 under 35 USC §103(a) based on Ramaswami et al, Abe et al, Figueredo et al, Taub et al and Hawkins et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 11-20, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

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In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Tung & Associates

Randy W. Tung
Reg. No. 31,311
Telephone: (248) 540-4040

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